COMPUTER AUTOMATION, INC.
the NAKED MINI company

CAI DS500 -00 8/73

NAKED MINI/ALPHA

POWER FAIL/RESTART LSI OPTION

Computer Automation's Power Fail/Restart (PFR) Option monitors power supply voltage to provide means for an orderly shut down of the NAKED MINI/ALPHA LSI Computer upon detection of a power failure. When power restoration is detected, the restart program is automatically executed by the computer and the program can resume where it was terminated by the power failure.

PFR is mounted on the processor module (unlike other processor options that are mounted on a small piggyback plug-in module) and therefore must be ordered with the computer since it cannot be retrofitted at a later date. This option is essential for remote installations where unattended operation is required, for on-line real-time data acquisition systems, and for monitoring or control systems where operating personnel are not computer oriented.

ADVANTAGES

- Protects memory against spurious data spikes during power fail.
- Power fail cycle provides 900 μsecs for orderly system shutdown.
- Power restart cycle guarantees 900 μsecs for restart subroutine.
- Jumper allows placing PFR outside normal EIN/DIN control.
- When used with Autoload Option, automatic Autoload sequence after power restoration is possible.
- Processor mounted option does not require separate I/O card slot in computer.

PATENT PENDING

HOW TO ORDER

Specify Product Number 12500-00 for all NAKED MINI/ALPHA LSI Computer systems. Power Fail/Restart Option is a prerequisite for Autoload Option and is strongly recommended for all NAKED MINI/ALPHA LSI Computer systems.

SPECIFICATIONS

DC Power Requirements	+5 Vdc @ 0.2 A (From processor power supply)
Interrupt Address	
Power Fail	:001C (offsettable to :011C)
Power Restart	:0000 (not offsettable)
Non-Volatile Memory Requirements	Two interrupt locations plus user defined Power Fail/ Restart subroutines
Volatile Memory Operation	Autoload Option may be initiated upon power restoration automatically
Timing	
Power Down	900 microseconds } maximum duration of Save and Restore subroutines
Power Restart	900 microseconds
Control	Normal operation under processor control. Jumper allows PFR to be outside EIN/DIN control.

TYPICAL PFR SUBROUTINE

The following example (in computers with non-volatile memories) saves program status and volatile registers when a power fail is detected, and restores the status and registers when power returns and continues the interrupted program.

```
                              Interrupt Locations
          ABS        0              Power Up Restart Location
          JMP        UP             Go To Power Up Routine
          ABS        :1C            Power Down Interrupt Location
          JST        DOWN           Execute Power Down Routine

          REL        0        Power Down
DOWN      ENT                       Entry To Power Down Subroutine
          SIN        1              Inhibit Byte Mode
          STA        ASAVE          Save A Register
          SIA                       Read Status Word In A Register
          STA        STAT           Save Status Word
          ICA                      )
          STA        CSAVE         )Save Console Data Register
          STX        XSAVE          Save X Register
          IMS        RUN            Set Flag to Show Process Stopped By Power Failure
          WAIT                      Halt Computer - Wait For Power Restoration

                             Power Up
UP        ZAR                      )Reset RUN Flag
          EMA        RUN           )
          JAN        $+2           )Test Run Flag
          HLT                      )Processor Halted Prior To Power Failure (NOTE)
          LDX        XSAVE          Restore X Register
          LDA        CSAVE         )
          OCA                      )Restore Console Data Register
          LDA        STAT           Read Status Word Into A Register
          SOA                       Restore Status
          SIN        1              Inhibit Byte Mode
          LDA        ASAVE          Restore A Register
          PFE                       Enable PFR Interrupts (if not under EIN/DIN control)
          EIN                       Enable All Interrupts
          JMP        *DOWN          Return To Interrupted Program

                             Status Data Storage
CSAVE     RES        1              Console Data Register Save Location
ASAVE     RES        1              A Register Save Location
XSAVE     RES        1              X Register Save Location
STAT      RES        1              Status Word Save Location
RUN       DATA       0              RUN Flag
```

NOTE

This sequence stops processor upon restoration of power if processor was not running when power failed.